

**TC9273N, TC9273F, TC9274N, TC9274F**

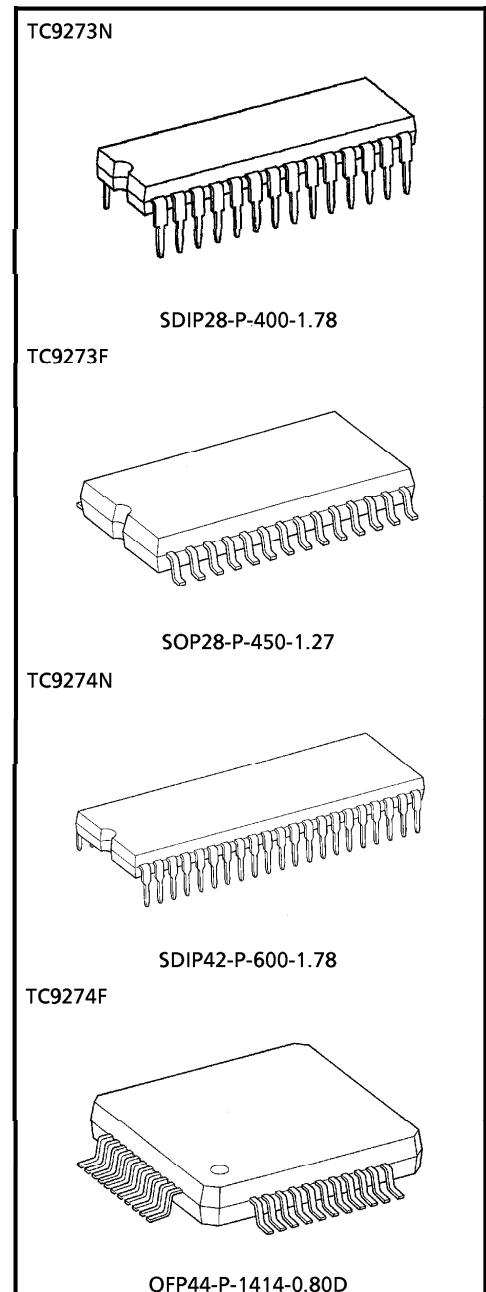
**ANALOG SWITCH ARRAY ICs**

TC9273N, TC9273F, TC9274N and TC9274F are analog switch array ICs developed for use in audio equipment such as home stereo sets. Switch connection layouts can be customized for different sets, thus simplifying the external wiring.

**FEATURES**

- 10 analog switches × 2 channels built in : TC9273N  
TC9273F
- 18 analog switches × 2 channels built in : TC9274N  
TC9274F
- An aluminum mask process allows switch connections to be customized.
- Switches are controlled by serial data.
- Built-in 5V microcomputer interface.
- Shrink DIP or flat package.

<b>Weight</b>	
SDIP28-P-400-1.78	: 2.2g (Typ.)
SOP28-P-450-1.27	: 0.8g (Typ.)
SDIP42-P-600-1.78	: 4.2g (Typ.)
QFP44-P-1414-0.80D	: 1.1g (Typ.)

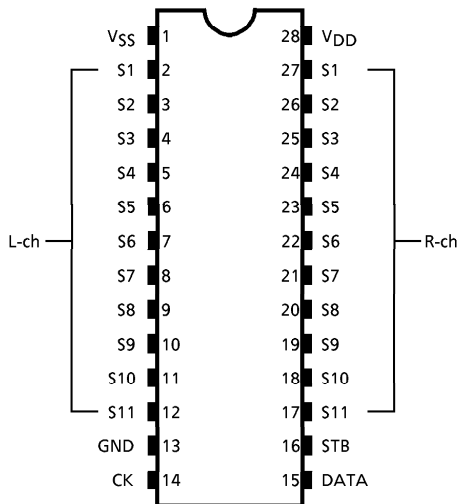


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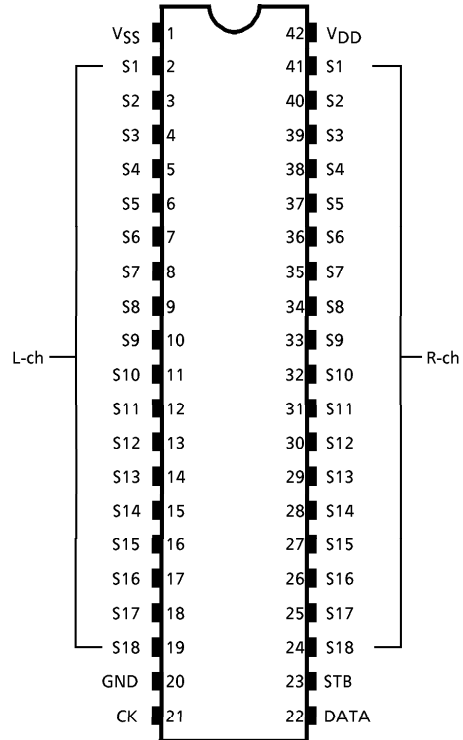
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**PIN CONNECTION (TOP VIEW)**

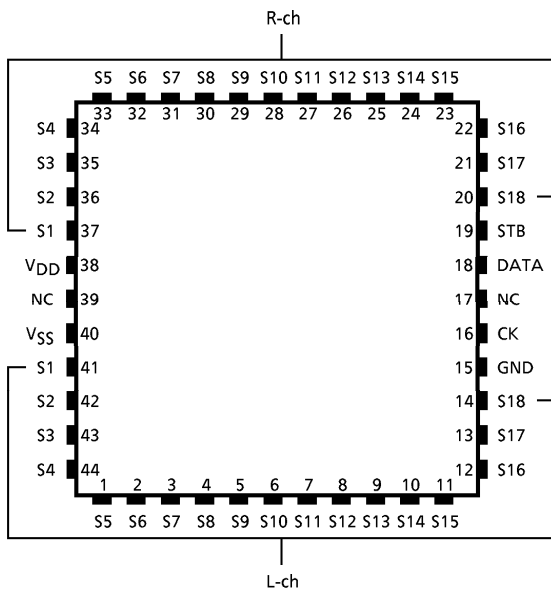
**TC9273N, TC9273F**



**TC9274N**



**TC9274F**

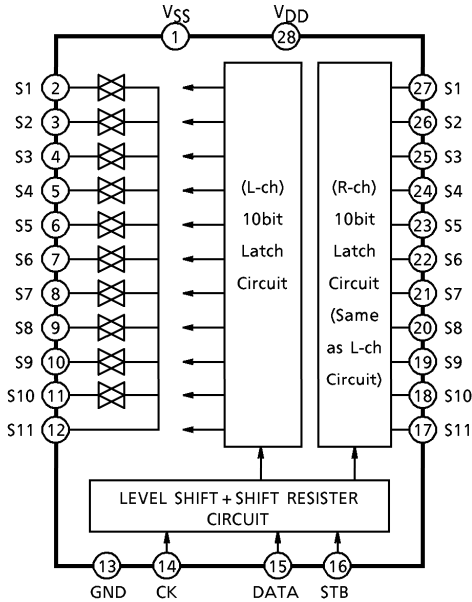


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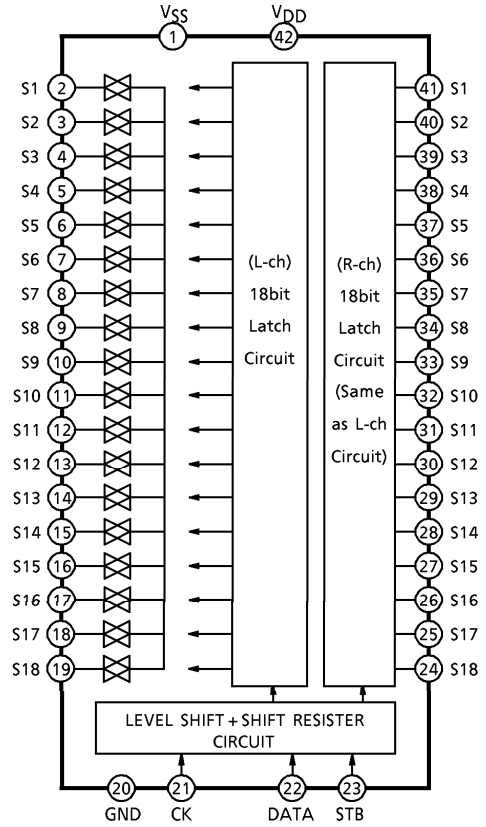
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**BLOCK DIAGRAM**

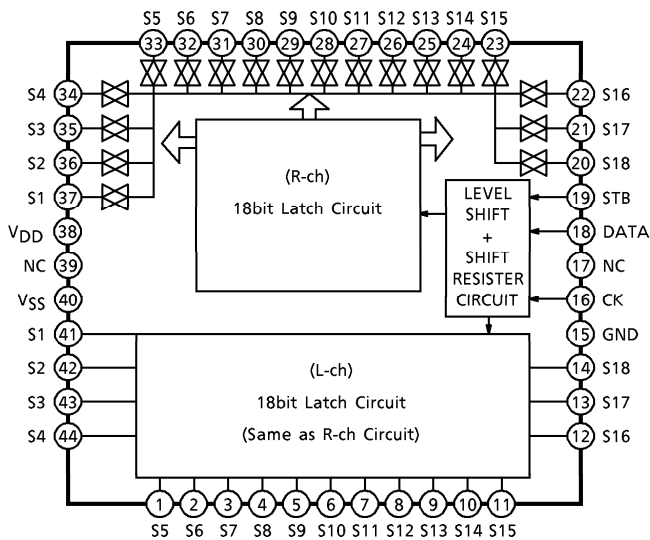
**TC9273N, TC9273F**



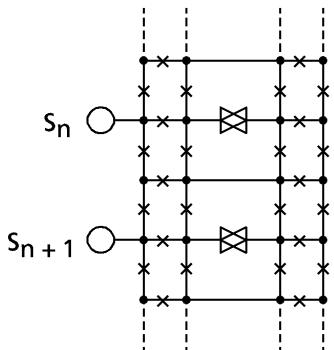
**TC9274N**



**TC9274F**



PIN FUNCTION (Left channel / right channel)

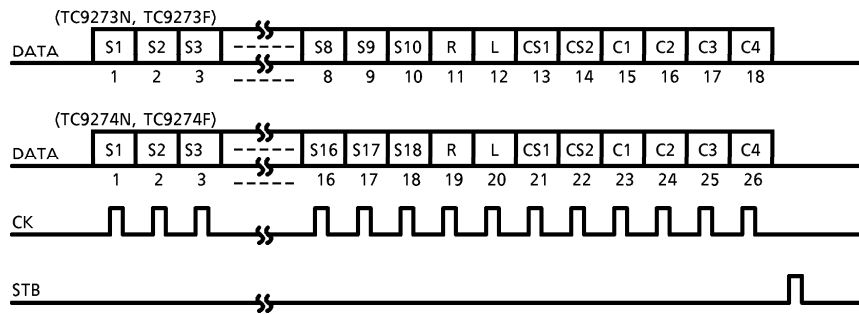
PIN No.			SYMBOL	PIN NAME	FUNCTION AND OPERATION	NOTE
TC9273N / F	TC9274N	TC9274F				
1	1	40	V <sub>SS</sub>	Negative power supply pin	Dual power supply $V_{DD} = 8.0 \sim 17V$ $GND = 0V$ $V_{SS} = -8.0 \sim -17V$	—
13	20	16	GND	Digital ground pin		
28	42	38	V <sub>DD</sub>	Positive power supply pin		
2 / 27	2 / 41	41 / 37	S1	Input / output pins	Analog switch input pins.  	—
3 / 26	3 / 40	42 / 36	S2			
4 / 25	4 / 39	43 / 35	S3			
5 / 24	5 / 38	44 / 34	S4			
6 / 23	6 / 37	1 / 33	S5			
7 / 22	7 / 36	2 / 32	S6			
8 / 21	8 / 35	3 / 31	S7			
9 / 20	9 / 34	4 / 30	S8			
10 / 19	10 / 33	5 / 29	S9			
11 / 18	11 / 32	6 / 28	S10			
12 / 17	12 / 31	7 / 27	S11			
—	13 / 30	8 / 26	S12			
—	14 / 29	9 / 25	S13			
—	15 / 28	10 / 24	S14			
—	16 / 27	11 / 23	S15			
—	17 / 26	12 / 22	S16			
—	18 / 25	13 / 21	S17			
—	19 / 24	14 / 20	S18			
—	—	17 / 39	NC	Not connected	—	—
14	21	16	CK	Clock input pin	Clock input for data transfer	Low threshold value input pins
15	22	18	DATA	Data input pin	Serial data input for setting switches	
16	23	19	STB	Strobe input pin	Strobe input for data writing	

**OPERATION**

1. Switch ON/OFF setting

The switches are set to ON or OFF using 18bit or 26bit serial data.

• Data format

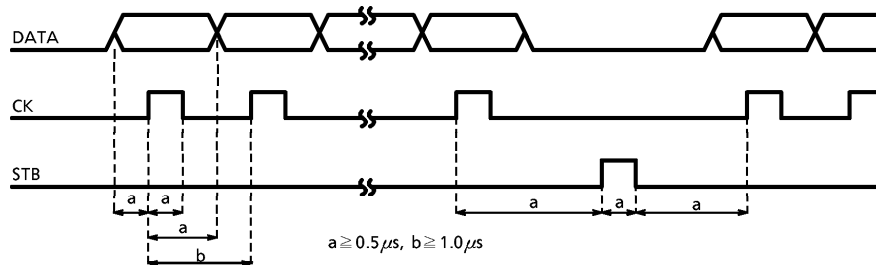


- 1) S<sub>1</sub>~S<sub>10</sub>~S<sub>18</sub> : Switch control data  
When S<sub>n</sub> = 1, S<sub>n</sub> is set to ON ; when S<sub>n</sub> = 0, to OFF.
- 2) R and L : Channel select data  
When R = 1, right-channel switches are set ; when L = 1, left-channel switches are set.  
(When R=L=1, both channel switches are set simultaneously.)
- 3) CS1 and CS2 : Sub-code data  
The sub-code data are customized.
- 4) C<sub>1</sub>~C<sub>4</sub> : Chip select data (fixed)

IC NAME	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
TC9273N, TC9273F	0	0	1	0
TC9274N, TC9274F	1	0	1	0

2. Serial data timing

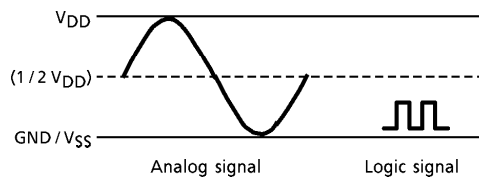
Input the CK, DATA and STB signals at the following timing.



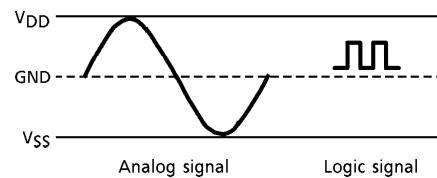
3. One and dual power supply operation

TC9273N, TC9273F, TC9274N and TC9274F can operate with one or dual power supply. With single or dual power supply, serial data logic level can be 0 – 5V.

• Single power supply operation



• Dual power supply operation



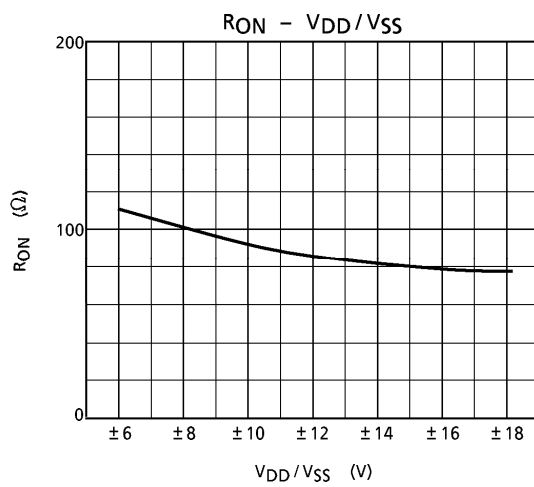
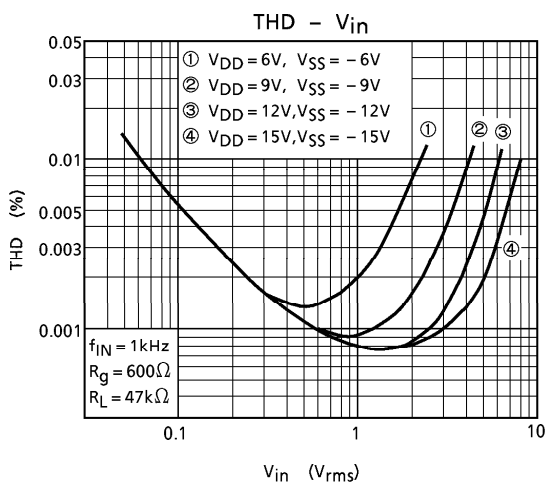
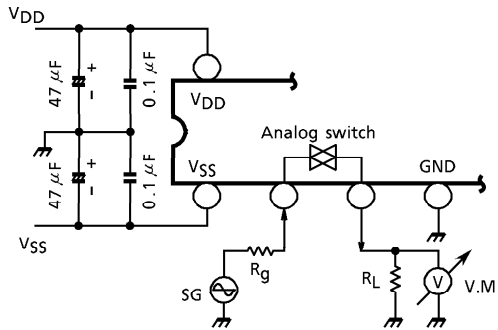
## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage (1)	$V_{DD} - V_{SS}$	-0.3~36	V
Power Supply Voltage (2)	$V_{DD} - GND$	-0.3~20	V
GND Input Voltage	$V_{IN} (1)$	-0.3~ $V_{DD} + 0.3$	V
$V_{SS}$ Input Voltage	$V_{IN} (2)$	$V_{SS} - 0.3 \sim V_{DD} + 0.3$	V
Power Dissipation	$P_D$	300	mW
Operating Temperature	$T_{opr}$	-40~85	°C
Storage Temperature	$T_{stg}$	-65~150	°C

ELECTRICAL CHARACTERISTICS (Unless otherwise specified,  $V_{DD} = 15V$ ,  $V_{SS} = -15V$ ,  $GND = 0V$ ,  $T_a = 25^\circ C$ )

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Supply Voltage (1)		$V_{DD} - V_{SS}$	—	Dual power supplying	16	~	34	V
Operating Supply Voltage (2)		$V_{DD} - GND$	—	Single power supplying	8	~	18	V
Operating Supply Current		$I_{DD}$	—	No-load, No-input	—	0.01	0.1	mA
Input Voltage	"H" Level	$V_{IH}$	—	CK, DATA, STB Terminal $V_{DD} = 8 \sim 18V$	4.0	~	$V_{DD}$	V
	"L" Level	$V_{IL}$			GND	~	1.0	
Input Current	"H" Level	$I_{IH}$	—	CK, DATA, STB Terminal	$V_{IH} = 15V$	~	1.0	$\mu A$
	"L" Level	$I_{IL}$			$V_{IL} = 0V$	~	1.0	
Operating Frequency		fop	—	CK, DATA, STB Terminal	0	~	1.0	MHz
Operating Minimum Clock Wide		Tck	—		0.5	—	—	$\mu s$
Switch-on Resistance		$R_{ON}$	—	Internal analog switch	—	80	100	$\Omega$
Analog Switch OFF Leak		$I_{OFF}$			-0.1	~	0.1	$\mu A$
Total Harmonic Distortion		THD	1	$f_{IN} = 1kHz$ , $V_{IN} = 1V_{rms}$ $R_g = 600\Omega$ , $R_L = 47k\Omega$ $BW = 20Hz \sim 50kHz$	—	0.001	—	%
Noise Output Voltage		$V_N$			—	1.0	—	$\mu V_{rms}$
Crosstalk		C·T			—	100	—	dB

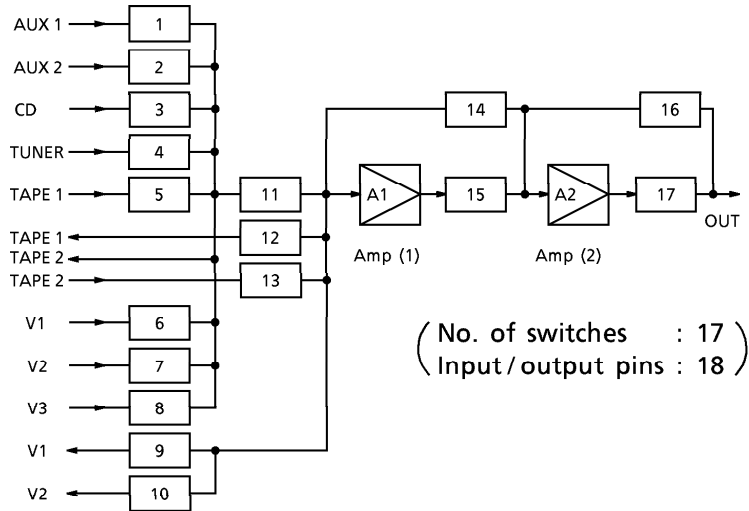
**TEST CIRCUIT 1 (THD/ $V_N$ /C-T)**



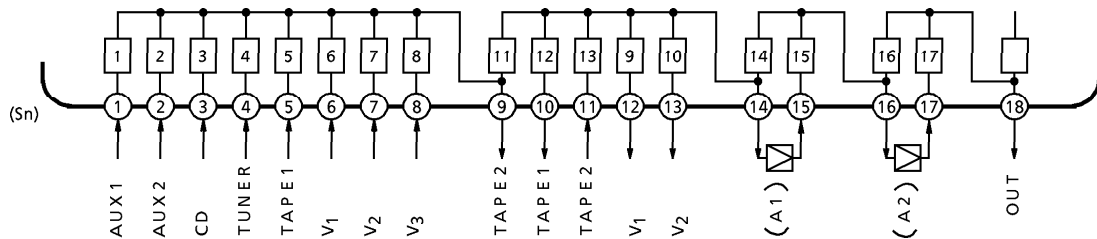


**APPLICATION CIRCUIT**

1) Typical switch connection for an application set. (N : Switch number)

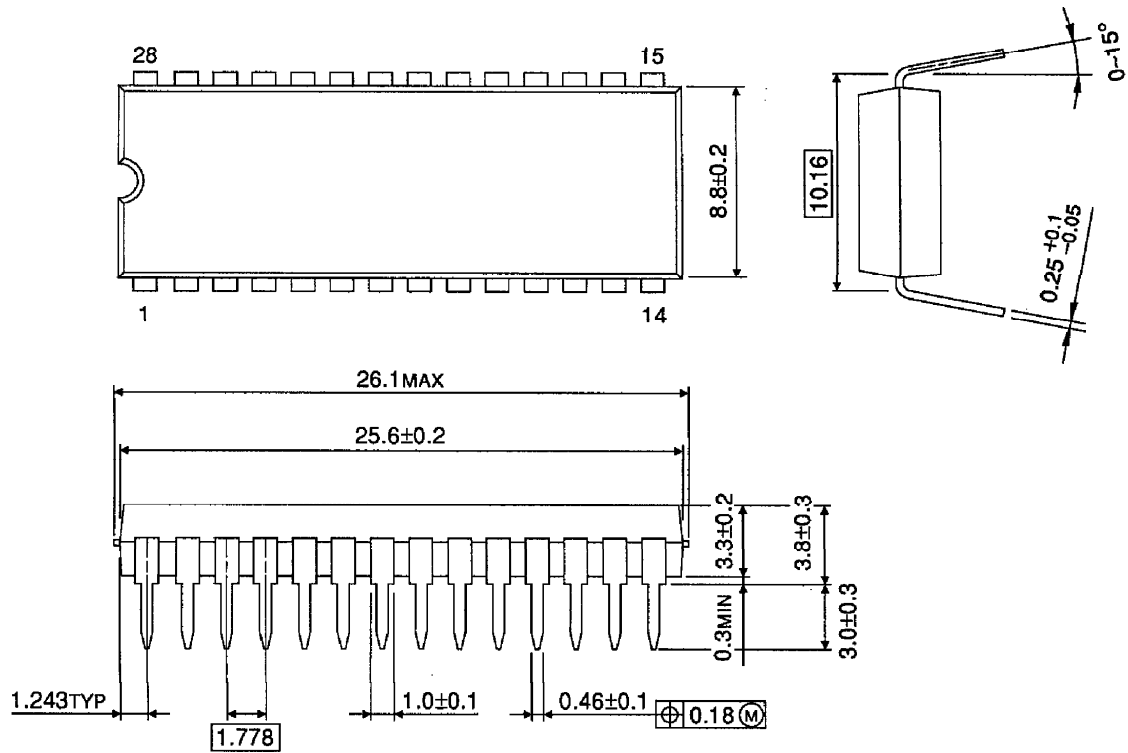


2) Typical switch array for the circuit above.



**OUTLINE DRAWING**  
SDIP28-P-400-1.78

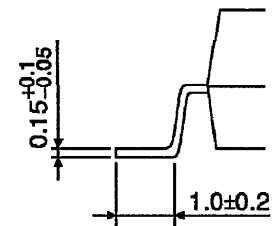
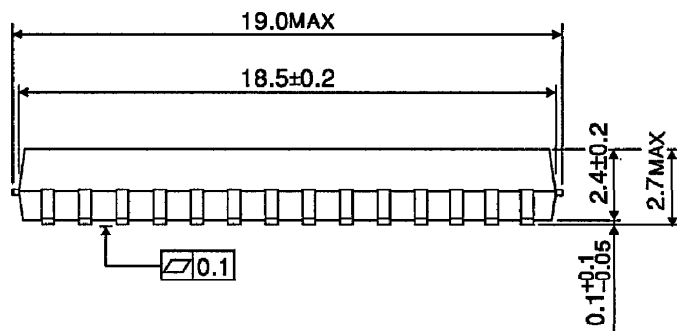
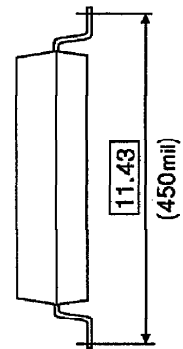
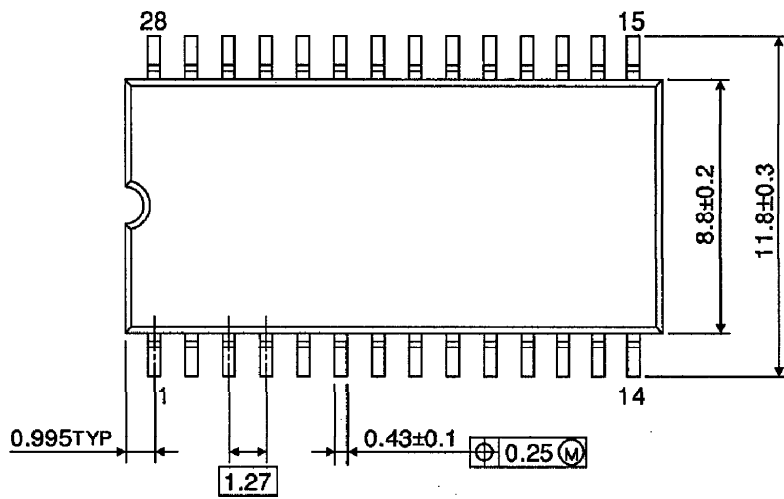
Unit : mm



Weight : 2.2g (Typ.)

**OUTLINE DRAWING**  
SOP28-P-450-1.27

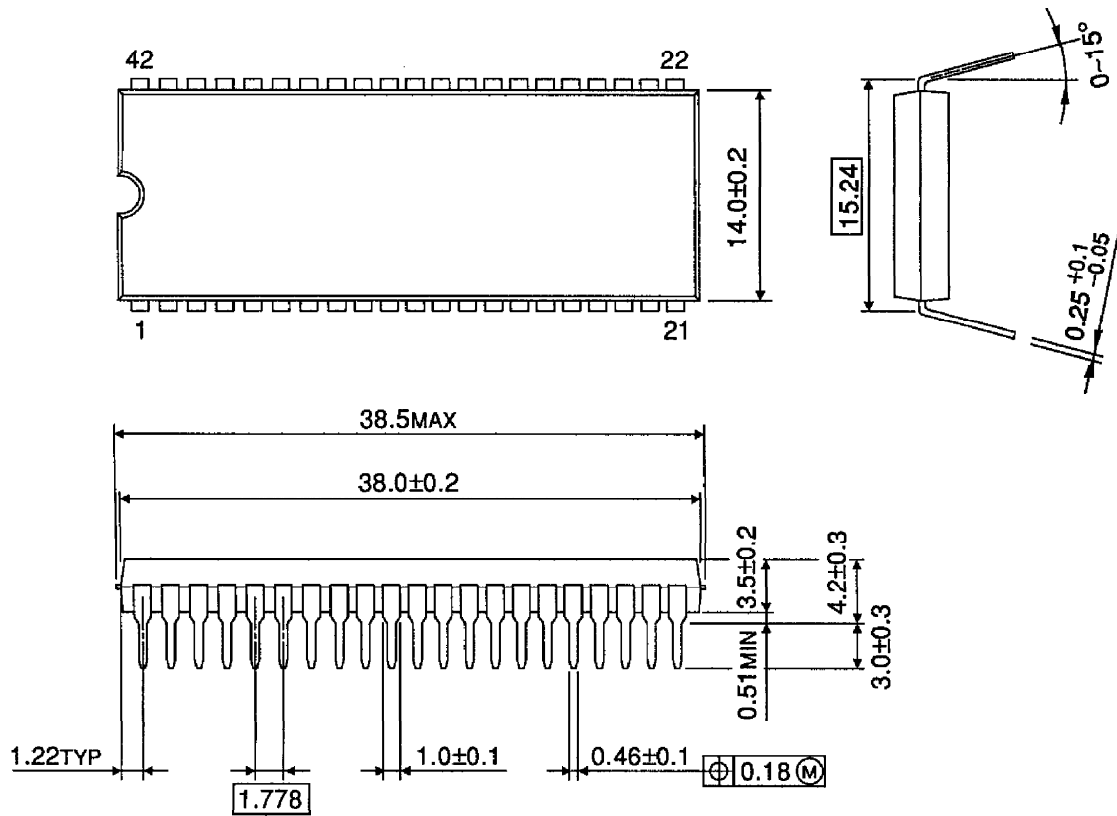
Unit : mm



Weight : 0.8g (Typ.)

**OUTLINE DRAWING**  
SDIP42-P-600-1.78

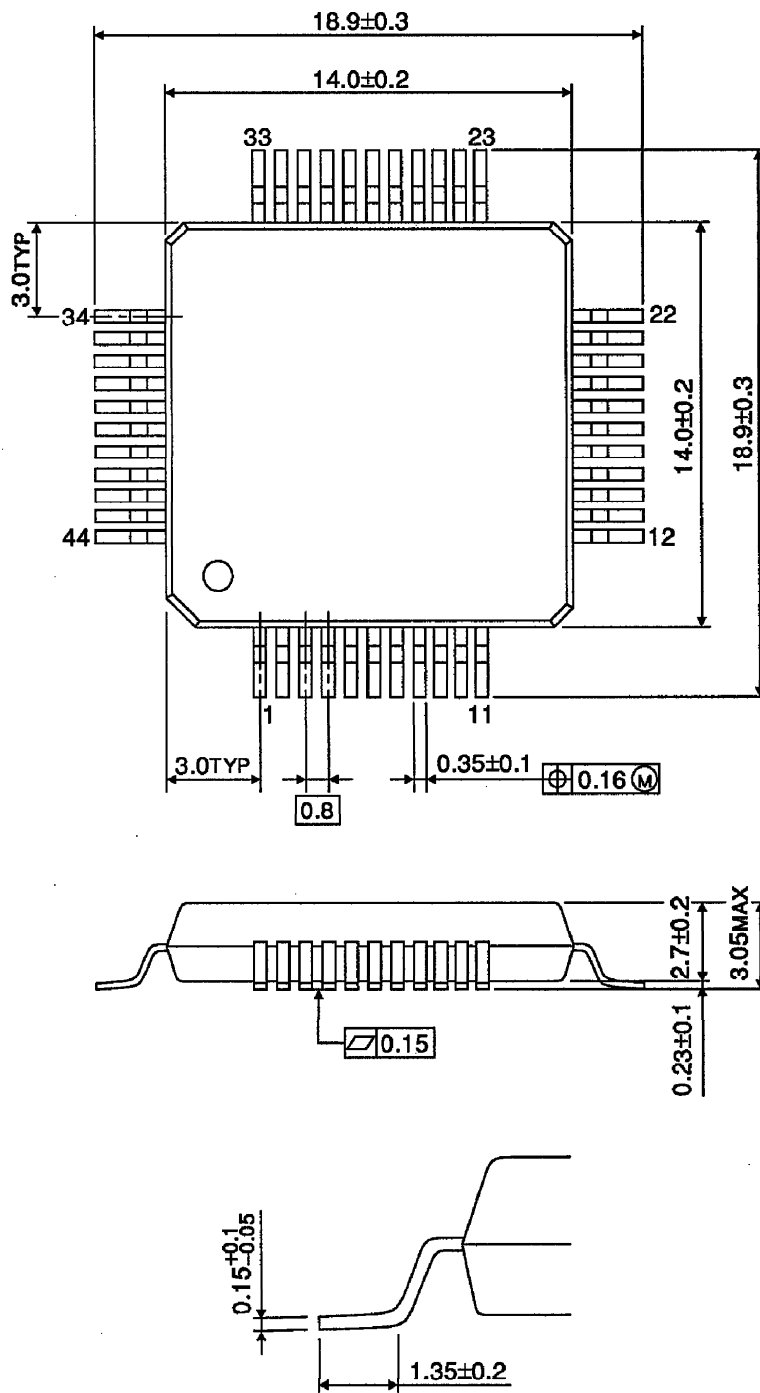
Unit : mm



Weight : 4.2g (Typ.)

**OUTLINE DRAWING**  
QFP44-P-1414-0.80D

Unit : mm



Weight : 1.1g (Typ.)